and white of egg, by which the loss of flavour by the old process has been overcome.

In regard to the author's condemnation of the statement that "the French cook makes excellent and nutritious soup out of materials which the English housewife throws away as useless, while her *pot-au-feu* is composed of stray scraps carefully husbanded, which cost her nothing, but which when skilfully combined constitute a useful and inexpensive food," we would observe that the use of the word *pot-au-feu* is obviously a mistake, but that had *marmite* been substituted there would have been no cause for objection. What says Sir Henry Thompson? "This (the *pot-au-feu*) is a different thing from the common 'stock-pot' of the French peasant, so frequently termed a *pot-au-feu* and confounded with it. The primary object of the 'stock-pot' is to make a decoction for soup—of animal food if possible—and every morsel of flesh, poultry, trimmings from joints, bones well bruised, &c., which are available for the purpose are reserved for it." This turning to account of scraps is, to our thinking, by no means a "delusion," but a thing that should be encouraged in every economically conducted kitchen. In nearly every other respect we are able to concur with Dr. Thudichum. He is undoubtedly right in pronouncing against the so-called clear soups of restaurants and hotels, in denouncing the free use of wine to smother defects, and the heedless use of cream and butter in *potages liés*, *bisques*, and *purées*.

Turning to his precepts concerning processes, we also find much that we can accept as excellent. Here and there are points, of course, in regard to which the best authorities differ. We would never put fresh meat or poultry, when either has to be cooked for the table by boiling, into *cold* broth or water, having found the method advocated by Sir Henry Thompson better than any other, viz. to immerse the joint or bird in a boiling medium to solidify or coagulate the albumen which pervades the outer layer of meat, and after five or six minutes at that temperature to reduce the heat beneath the vessel to simmering point, never exceeding 180° F. We apply the same principle to the preparation of fish with equally satisfactory results, having proved the accuracy of Sir Henry's axiom that boiling fish in the ordinary manner is of all systems the most wasteful and unsatisfactory. There can be no doubt, though it is contrary to Dr. Thudichum's theory, that the greatest benefit is to be derived from broth made from fish-bones and "cuttings" of white fish, assisted by herbs and vegetables. This we employ as a moistening in our method of fish-poaching, and consider it superior to *court bouillon* with its excessive amount of wine, which Dr. Thudichum very properly condemns.

There is another point on which the doctor's advice is open to question. We refer to his definition of braising as a species of "roasting." Surely this is contrary to the teaching of the best authors. "Braiser la viande," says Dubois, "c'est la cuire à l'étuvée dans un bon fonds de façon à l'atteindre complètement, en lui conservant ses sucs nutritifs." How can a piece of meat be said to be "roasted" when it is moistened in the *braisière* with *bouillon* "*à hauteur*"? The fact is there are varieties of braising. The French cook adopts one method, for instance, for white, and another for brown meats, and, as we read in "Food and Feeding," these vary in treatment. In all the predominating feature is stewing, though the part of the meat exposed by the gradual reduction of the moistening broth may be browned by heat transmitted downwards from hot cinders on the lid of the vessel. The meat is really part stewed, part steamed, and superficially toasted. Dr. Thudichum says nothing of the amount of moistening *mirepoix* necessary for braising, the preliminary browning of the meat, the *couche de racines et oignons émincés* on which it should be placed, the reduction of the first partial moistening, and then the final filling up level with the top of the meat. Without these instructions, how is the student to have placed in his hands "the means of attaining his object with certainty and elegance?"

But the few points to which we have taken exception are of no great consequence in a work which covers as much ground as "The Spirit of Cookery." Some of them might perhaps have been passed over as appertaining to practical work, which Dr. Thudichum may not have intended to explain minutely. There is, as we have said, a great quantity of information which is beyond criticism, plenty of advice which is full of common sense, and a painstaking classification of the principal sections of the art which cannot but be useful to students of cookery. The scientific principles, by which all intelligent work should be guided, are very clearly laid down. The notes on the preparation of food for the sick-room and the camp are excellent, and all who recognise the necessity of encouraging cookery for the palate rather than for the eye will concur in Dr. Thudichum's observations regarding the vulgar folly of over-ornamentation.

WEATHER OBSERVATION AND PREDICTIONS.

Meteorology, Weather, and Methods of Forecasting, Description of Meteorological Instruments, and River Flood Predictions in the United States. By Thomas Russell, U.S. Assistant-Engineer. (New York: Macmillan and Co., 1895.)

Results of Rain, River, and Evaporation Observations, made in New South Wales during 1893. By H. C. Russell, B.A., C.M.G., F.R.S. (Sydney: C. Potter, 1894.)

THE first of these two books has for its aim the instruction of those who are interested in the weather, and wish to make forecasts on scientific lines, or to understand the principles which underlie the predictions issued by responsible authorities. The expression "scientific lines" is, perhaps, not justified. Experience plays, probably, as large a part as science. The knowledge of the character of the weather that has followed certain definite atmospheric conditions in former cases, is to some extent a guide as to what will happen when those conditions again present themselves, and possibly as true a guide as any result based on the wider knowledge of the general circulation of the atmosphere. Especially has the particular study of the direction and rate of motion of cyclonic areas, with their attendant phenomena of rain, and change of temperature permitted a greater amount of security in weather predictions for short intervals of time. But this great certainty is based upon experience and observation, rather than upon purely thermo-dynamic principles.

The evidence of decisive progress in forecasting is wanting. Nor does the author hold out a very sanguine hope of the possibility of issuing in the immediate future successful weather forecasts over large districts from a central bureau. There are not more than six to twelve occasions, in the course of a year, for any part of the country, he tells us in the preface, "where successful predictions can be made, and for some places successful predictions are never possible." "Successful continuous predictions for every day are not possible." This is the opinion of one who apparently has ample means of forming an adequate judgment. It is the outcome in a country where the opportunities of framing forecasts are many and favourable. The service is well supplied both with funds and officers, the vast telegraphic system of the country is at the disposal of the Weather Bureau, the area over which the data are collected is extensive enough to enable the whole development of a storm to be watched and reported, while the favourable situation of Washington, in the extreme east of the continent, is a point not to be omitted. Yet after years of trial, the opinion of one who apparently has official connection with the system, or is at least well supplied with information from the Bureau, is, that the complete solution of the problem is not only impossible, but is only practically effective on the average less than once a month. If this be the result under favourable conditions, what, it may be asked, is the system worth in England, where our insular position cuts off the supply of any information from the West, the direction in which our principal storms approach, and the intelligence from the East has to be supplied by the courtesy of many nationalities, and more or less hampered by different telegraphic systems.

To return to the book, however, which in some respects is a little disappointing. There is an occasional appearance of hurry in the compilation of the work, which has sometimes prevented the author expressing himself with sufficient clearness, and with the reservations which are sometimes necessary. For instance, we are told, on p. 3, that there is less oxygen in the air when the wind is from the south, than when the direction is north. This may be true for the district in which the author lives, but as there is no indication where this particular locality is situated, and the preface is not even dated, we are left to infer that the remark applies to the earth generally, which can scarcely be correct. Again, on p. 184, in the description of secondary low pressures, occurs this sentence. "In Fig. 29, thunderstorms are very apt to occur with secondary low pressures." This statement is certainly a puzzle. On p. 190 we are referred to a map on the adjoining page. There is no map there, although this map is referred to in the list of illustrations. Readers will, however, find it at the end of the book. Sometimes, too, facts which are easily verified are not quoted with accuracy. On p. 5, the dates of the earth's perihelion and aphelion passage are given as December 23 and June 21 respectively. The area of the Caspian Sea is given on p. 101 as over 200,000 square miles, and on p. 201 as 180,000 square miles. But these and many other small blemishes can be removed in a future edition.

We are more concerned to look at the work as a whole, and to consider what special service is it likely to render among the host of meteorological treatises that are continually appearing on one or other side of the Atlantic We have, of course, the ordinary chapter on meteorological instruments; we have the cloud classification; we have the description of the rain and hail and snow, that too frequently make life unpleasant; together with all the winds that blow, or are likely to blow. And the oft-told tale, it must be confessed, is repeated in rather a jerky manner, partaking of something of the manner of a dictionary, wherein one is treated to a collection of definitions. The last chapters of the book are undoubtedly the best. There the author has something to tell us of processes not generally described in books like the present. To the charm of novelty is added the advantage that we feel we are listening to a practical expert, who can tell us all that is worth knowing about river-floods and overflows.

We come now to the second volume under notice. Fortunately in this country we are not frequently troubled by the overflow of rivers and the consequent destruction of property on the banks, and therefore the subject with us receives scant attention. Probably for this reason the report of the Meteorological Council is silent on such matters, though at times like last autumn, the inhabitants of Eton, Oxford, and the Thames Valley would have been gratified by a timely warning. It may have been that warnings were given, but from the absence from the Report of any mention of machinery adapted to this end, one would infer that this is an inquiry the Council do not consider worthy of their attention. Far different is it with the Astronomer at Sydney, whose latest report is mentioned at the head of this notice. There the subject is forced on the attention of scientific men; and on the unscientific, too, if he happen to live in a district where, as Mr. Russell reports, the rise of a river was so rapid that in less than two hours a part of a town was covered to a depth of three or four feet, and the people were glad to escape with their lives at the sacrifice of their property. Mr. Russell has great difficulties to contend with. He has not only the small equipment peculiar to a comparatively new colony, imperfect data, and the slow accumulation of facts, but the first warning of the rise of a flood may occur in uninhabited or thinly populated districts, with which communication is slow and uncertain. The American Bureau has not to struggle against these disadvantages, but the problem depends upon so many variable quantities that the complete solution is practically impossible.

The author of the treatise on meteorology lays it down that very little connection can be traced between meteorological laws and river floods, except perhaps in cases where the quantity of water is dependent upon the melting of the snow. In temperate zones, floods occur without any very noticeable great rainfalls. Intermittent rain may cause a river to rise very slowly, and almost imperceptibly, till it be bank-full, when a moderate rain makes the river overflow. Neither is there any decided connection between the river slopes and velocity, so that the velocity of the flow cannot be computed from a knowledge of the slope. The character of the ground over which the rain falls—that is, the degree of permeability—is a fruitful source of uncertainty in predicting the probable rise. There are many other obvious sources of error, so that no one can be surprised to learn that the theoretical determination of a river rise cannot be treated as a problem in hydraulics. Without a system of gauges along the river, predictions are scarcely possible. With their employment, the problem becomes more or less one of practice and experience. This remark may be illustrated by showing how the rise of the river may be predicted for Pittsburg, a place where the observations of rainfall simply, are of little use in foretelling with accuracy the height to which the river will rise. The rise is predicted from observations of the rise at stations above the town, or on tributaries. Gauges are maintained at Oil City, Brookville, Confluence, Rowlesburg, Weston, and Johnstown. These towns lie both north and south of Pittsburg, and the greatest separation may amount to two hundred miles. The height of the river and its tributaries at each of these places not only exercises a different effect at Pittsburg, presumed to be proportional to the square root of the areas drained by the rivers at each station, but the height of the river at Pittsburg itself has also to be taken into the account. The higher the stage at Pittsburg, the less will the river be affected by the same rise at the upper stations. "It is assumed that the rise multiplied by the mean stage during the rise is comparable throughout different stages for Pittsburg." The factors deduced from the area drained vary from 2·1 for Oil City to 0·1 at Weston, and the observed rise between two consecutive days multiplied by these factors can be easily tabulated to exhibit the expected rise at Pittsburg. Mr. Russell has worked out some examples to show the successful application of this method. On February 16, 1891, the calculated height of the stage was 31·3 feet; the observed, 32 feet. On February 6, 1893, the calculated height was 23 feet; the observed, 23·1. It does not appear how far these examples are illustrative of the success attending the general application, but the system seems to leave nothing to be desired. The author takes us regularly down the Ohio River to Cincinnati, Louisville, and Cairo, the junction with the Mississippi, illustrating the modifications which varying conditions may render necessary. The Missouri and the Mississippi also receive their share of attention, and the book forms a very practical guide for those interested in such matters. The value of the whole process rests on the provision of a sufficient number of well-placed gauges, and a long series of observations, from which may be learnt the probable behaviour of the river under all circumstances. It is in this direction, apparently, that Mr. Russell, of Sydney, finds his opportunity, and the great mass of facts that he is collecting will be of the greatest use as the colony becomes more thickly peopled. We do not understand that he has yet arrived at the stage of predicting with accuracy and confidence the vertical rise and fall of the rivers over which he watches. His part, if apparently less interesting, is not less useful; and he is to be congratulated on the spread of his system of observations and his successful overthrow of many difficulties.

AN ALBUM OF CLASSICAL ANTIQUITIES.

Atlas of Classical Antiquities. By Th. Schreiber. Edited for English use, by Prof. W. C. Anderson, of Firth College, Sheffield. (London: Macmillan, 1895.)

THIS work should hardly be called an Atlas, since, though it contains a vast amount of matter, the disjointed arrangement is by no means that of an Atlas. The abundance of illustrations, however, makes the book exceedingly valuable to the student.

But although there may be, and is the *facundia*, the *lucidus ordo* is frequently wanting. Still, by the help of the excellent trilinqual index, supplied by the English editor, this defect is much remedied.

The book should also be judged by reference to what it aims to be. If considered as a work addressed to artists or specialists, great deficiencies in the technical execution of the plates would have to be complained of; but it should be looked at mainly as a series of rough sketches of ancient life as revealed to us through art, for the instruction of students in literature and commencing archæologists, or as a general book of reference. The above remarks refer entirely to Herr Schreiber's plates; nothing but praise should be accorded to Prof. Anderson as translator and expositor. The aim of the work is sufficiently stated in the preface.

"There springs up a desire for facts—facts as to the life of the ancients, their laws and their customs, their beliefs and their cults. Because no fact is despicable from the point of view of science, we further look into their daily life—the fashion of their dress and their houses, the arrangements of the theatre and the market-place. And since no source of facts can be so perfectly trustworthy as the works of contemporary art, those works gain an interest, arising not merely from their own beauty, but as the crystallisation of the visible life of the people, a mirror of their thought preserved to us like many actual Greek mirrors in the graves of the dead."

The series of plates begins with theatres and acting; and with respect, at least, to Roman or Romanised Greek theatres, they are very fully illustrated, both as regards the fabric and the actor, but there is a remarkable absence of the characteristics of the Greek theatre as distinguished from the Roman, which have been much under discussion of late years. Plate iii., Fig. 3, however, introduces a representation of the raised stage or λογεῖον, which, if the date ascribed to it in the text be accurate, bears strongly against the theory that all the action took place on the level of the orchestra until the raised *pulpitum* was introduced by the Romans. In Plate ix. we see that some of our modern building appliances have been in continuous use since classical times. In Plate x., Fig. 3, after Durm, the contrivance of the wooden blocks and pin in the joints of the columns of the Parthenon is not accurately shown, and it is therefore not surprising that in the text a difficulty is hinted at. The smaller shallow circle was not provided for the purpose of receiving a wooden cylinder to turn in. This was the function of the smaller pin or cylinder of hard wood, which was centred in the square wooden blocks which were fixed in each bed of the joint. The shallow circle in the stone was provided to receive the detritus caused by rubbing the stones together. In the same plate ornament is shown on the echinus of the Doric capital.